# Sullivan's Ledge Superfund Site New Bedford, Massachusetts Site Operations and Maintenance Manual

## Sullivan's Ledge Superfund Site
## New Bedford, Massachusetts

February 2002

O'BRIEN & GERE
ENGINEERS, INC.

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# Operations and Maintenance Manual

## Sullivan's Ledge Superfund Site
## New Bedford, Massachusetts
## Site Operations and Maintenance Plan

***Sullivan's Ledge Superfund Site***
***New Bedford, Massachusetts***

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James Heckathorne
Vice President

February 2002

O'BRIEN & GERE
ENGINEERS, INC.

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# 1. Introduction

## 1.1. Overview

This document constitutes the Site Operation and Maintenance Plan (Site O&M Plan) for the Sullivan's Ledge Superfund Site in New Bedford, Massachusetts. This plan has been prepared in accordance with the requirements of the Consent Decree and the RD/RA Statement of Work (SOW).

## 1.2. SOW requirements for operation and maintenance

Section VIII.C.1.j of the SOW requires the development of an Operations and Maintenance Plan. Section VIII.C.1.j.ii of the SOW includes the following requirements:

a. Maintenance of the integrity and effectiveness of the Remedy, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

b. Maintenance and operation of the ground water monitoring system to monitor the efficiency of closure of the First Operable Unit, as described in Section VI.B.3 of the SOW;

c. Protection and maintenance of surveyed benchmarks and site security measures in compliance with 310 CMR 30.626;

d. Prevention of run-off and run-on eroding or otherwise damaging the cap;

e. Sediments, soils, wetlands, ground water and air monitoring adequate to monitor the effectiveness of the remedy and closure of the First Operable Unit;

f. Maintenance and operation activities in accordance with TSCA 40 CFR 761.75 (b) (9);

g. Maintenance and operation activities in accordance with 310 CMR 30.622 (7) through (10);

h. Compliance with other applicable state and federal requirements;

i. Requirements described in Section VI.B of the SOW) (i.e., Long-Term Monitoring);

j. Submittal of yearly reports describing the results of the monitoring of the implementation and effectiveness of the institutional controls specified in Section VII.A. of the SOW;

k. Maintenance of records for all current structures and equipment remaining on-site or used as components of response activities, or during operation and maintenance. Such reports shall include, at a minimum, the date(s) of purchase(s), maintenance procedures, repair history, warranties and names of service representative(s).

For convenience, copies of the cited state and federal regulations are included in Appendix A.

Section VIII.C.1.j.i of the SOW requires a post closure plan in accordance with the requirements set forth in 310 CMR 30.590 and 310 CMR 30.633. 310 CMR 30.593 includes the following specific Post-Closure Plan requirements:

a. A description of the planned monitoring activities and frequencies at which they will be performed to comply with the requirements set forth in 310 CMR 30.610 through 30.679

b. A description of the planned monitoring activities, and frequency at which they will be performed, to ensure

1. The integrity of the cap and final cover or other containment systems in accordance with the requirements set forth in 310 CMR 30.610 through 30.659

2. The function of the monitoring equipment in accordance with the requirements set forth in 310 CMR 30.610 through 30.659

310 CMR 30.633 generally reiterates the requirements of 310 CMR 30.593 and SOW items VIII.C.1.j.ii (a) - (k).

## 1.3. SOW O&M requirements addressed in this document

This document has been prepared to address SOW items VIII.C.1.j.i. and SOW items VIII.C.1.j.ii (a), (c), (d), (f), (g), (h), (j), and (k), and includes

a description of planned maintenance activities and the frequency at which they will be performed for:

- the landfill cap, including appurtenances such as the landfill gas venting system, surveyed benchmarks, access roads, and run-on and run-off control features; and

- the lined portion of the Un-Named Stream, including Vault 1, the 72-inch Pre-Stressed Concrete Cylinder Pipe, and Vault 2.

This Site O&M Plan is an update of the Operations and Maintenance Plan which was approved by USEPA on June 9, 1997 and finalized by O'Brien & Gere on July 2, 1997.

## 1.4. SOW O&M requirements addressed elsewhere

This Site O&M Plan does not describe operations and maintenance requirements for ground water recovery and treatment components. A separate plan (Ground Water Treatment Plant Operation & Maintenance Manual, O'Brien & Gere Engineers, June 28, 2000, updated on August 30, 2000), which was approved by USEPA on October 20, 2000, presented operation and maintenance requirements for ground water recovery and treatment equipment at the site. It should be noted that a more detailed ground water recovery plan will be prepared based on hydraulic testing proposed for the first half of 2002.

This Site O&M Plan does not describe maintenance and monitoring requirements for site wetlands. Maintenance and monitoring requirements were included in the site Wetlands Restoration Plan, which was approved by USEPA on June 9, 1997 and finalized by O'Brien & Gere Engineers on July 2, 1997. As discussed in USEPA's letter to O'Brien & Gere dated October 27, 2000, Operable Unit 1 is working with Operable Unit 2 and the Contractor (Harding Lawson Associates) to develop an updated plan that is more consistent with the Operable Unit 2 Wetlands Monitoring Plan. It is anticipated that this plan will be submitted during the first quarter 2002.

Finally, this Site O&M Plan does not describe monitoring requirements for ground water, surface water, sediments, or landfill gas. A separate document, the Post-Construction Environmental Monitoring Plan, which was approved by USEPA on June 9, 1997 and finalized by O'Brien & Gere on July 2, 1997, addresses the monitoring requirements of Section VIII.C.1.j.ii (b), (e), and (i) of the SOW, as well as the monitoring requirements included in 310 CMR 30.590 and 310 CMR 30.633.

# 2. Site operation and maintenance

## 2.1. Overview

This section describes the operation and maintenance that will be performed on the following site features:

- Landfill Cover
- Surveyed Benchmarks
- Run-on / Run-off Controls
- Gas Venting System
- Site Security Features
- Access Roads
- Lined Un-named Stream

A site-specific recommended inspection checklist has been provided for convenience in performing the routine cap system inspections. The checklist is provided as Table 2-1. Drawings illustrating the locations of site features are provided on Figures 1 and 2.

## 2.2. Landfill cap

### 2.2.1. Description

The landfill cap installed at the Site consists of the following elements, starting from the bottom up:

- *Gas venting layer.* A 12-in sand layer, having a minimum permeability of $1x10^{-3}$ cm/sec, was installed as the gas venting layer. The purpose of the gas venting layer is to allow an area beneath the impermeable cap layers for the collection of venting gas generated from decomposing wastes.

- *Geosynthetic clay layer.* A geosynthetic clay liner (GCL) was installed above the gas venting layer. The (GCL) is the lower component of a two-component low-permeability barrier system designed and installed to divert or impede the vertical percolation of water coming into contact with it.

- *Flexible membrane cover.* The flexible membrane cover (FMC) consists of a portion of smooth and a portion of textured 40 mil linear low density polyethylene (LLDPE) geomembrane. The flexible membrane cover is the upper component of a two-component low-permeability barrier system designed and installed to

divert or impede the vertical percolation of water coming into contact with it.

- *Synthetic drainage layer.* A synthetic drainage layer consisting of a geonet bonded on each side by a non-woven, needle-punched geotextile was installed above the flexible membrane cover. The synthetic was installed to intercept water from the precipitation that percolates down through the layers above, and to transport this water to the edge of the cap.

- *Barrier protection layer.* A 30-in thick barrier protection layer was installed over the synthetic drainage layer. The barrier protection layer provides support to the vegetative layer and protects the flexible membrane cover from external forces.

- *Vegetated topsoil layer.* A 6-in topsoil layer was placed above the barrier protection layer and then vegetated. The vegetated top soil layer provides water-holding capacity to attenuate rainfall/snowmelt infiltration to the drainage layer, sustain vegetation through dry periods, and minimize the potential for surface crack formation and erosion.

### 2.2.2. Inspection and maintenance

Routine inspection of the capped area and immediately adjacent areas will be performed monthly during the first year following the establishment of vegetation and quarterly thereafter. USEPA will be informed of the inspections at least one week in advance of the inspections to enable their participation in the inspections. The inspector will observe the condition of the vegetative cover for areas of thinning vegetation or other signs of vegetative stress, burrowing animals, settlement, erosion, slope instability, or any other damage to the capped area.

Routine cap inspection will also note any problems with thinning vegetation. Areas which appear to be thinning out over time will be over seeded to keep the vegetative cover uniform.

Deep rooting shrubs, brush, or trees will not be allowed to establish on the cap. Mowing will be performed twice annually (early summer and late summer) or as required to prevent the establishment of woody plants (trees) that may penetrate the flexible membrane cover.

If burrowing animals or signs of the presence of burrowing animals are observed within the limits of the capped area, live traps will be set. The captured animals will be relocated off the capped area and any holes produced by the animals in the capped will be filled with like existing material.

The cap will be instrument surveyed forty days after completion. The instrument survey will consist of establishing a 50-ft grid on capped

areas. If the slope of the top of the cover decreases from the design minimum of 4% to less than 3% due to settlement, additional cover material will be placed on those areas of the cover to re-establish a 4% slope. An instrument survey of the cap will also be conducted one year, two years, and five years after cap completion, with additional cover material being placed on portions of the cap where settlement results in less than a 3% slope, to re-establish a 4% slope.

Should areas of settlement, erosion, or slope instability be noted, regrading and/or restoration will be conducted to promote drainage, minimize erosion, and minimize percolation of water into the cover.

## 2.3. Surveyed benchmarks

### 2.3.1. Description

Three surveyed benchmarks are provided on the Site drawing. One is located north of Vault #2 across Hathaway Road. A second benchmark is located near the Groundwater Treatment Plant on the western side of the Site. The third surveyed benchmark provided is located on the eastern side of the site near Vault #1. The locations of the benchmarks are shown on Figures 1 and 2.

### 2.3.2. Inspection and maintenance

On-site surveyed benchmarks will be maintained. The benchmarks will be inspected for signs of damage at the same frequency as the cover.

## 2.4. Access road

### 2.4.1. Description

The access road is located on the cap system along the north, east and west sides. The access road will be used to access the pump station, the wet well, the interim recovery wells, the shallow collection trench manholes, Vault 1, Vault 2, ground water monitoring wells, and perimeter gas monitoring wells. The access road is 12 ft wide and is made of gravel to a depth of approximately 12 in.

### 2.4.2. Inspection and maintenance

The access road on the cap system will be inspected with the same frequency as the landfill cap and repaired promptly, as necessary to support the operation and maintenance of the site.

The access road will be maintained so that traffic access will be maintained and uninterrupted by inclement weather. Snow will be plowed from access roads promptly to allow access to the site for maintenance. The use of road salt will be limited to those areas which do not drain the vegetative cover.

## 2.5. Site security features

### 2.5.1. Description

A chain link fence surrounds the Site providing site security. The chain link fence is 6 feet high with an additional 1 ft of barbed wire above the chain link portion. A slide and a swing gate are present on northern boundary for access to the treatment plant, and man gates are located on the eastern and southern boundaries.

### 2.5.2. Inspection and maintenance

A site security inspection will be conducted monthly. It is recommended that breaches in fence integrity be repaired promptly and that signs be replaced promptly. It is also recommended that the access gate be kept locked while the Site is unattended.

## 2.6. Gas venting system

### 2.6.1. Description

The gas venting system includes a total of 15 passive gas vent risers. The passive gas vents consist of 6-in diameter solid ASTM A-53 Schedule 40 steel risers. The passive gas vent risers extend a minimum of 6 ft above the finished grade of the landfill cap. The base of the gas vent riser includes a 10 ft horizontal tee within the gas venting layer, and a vertical section that extends 1 ft into pre-existing grade. The slotted portion of the riser pipe is wrapped with a non-woven, needle-punched geotextile.

One of the passive gas vent risers (GV-15) extends into the permeable material of the shallow ground water collection trench. In addition, four of the passive gas vent risers (GV-8, GV-12, GV-13, and GV-14) are connected to a horizontal perforated gas collection pipe, which runs along the western boundary of the site and a portion of the eastern boundary.

A total of 22 gas monitoring wells are located along the perimeter of the site. The gas monitoring wells are 13 ft deep, and include 10 ft of 2-inch PVC well screen in a 6-inch diameter borehole, with a well pack of permeable material.

### 2.6.2. Inspection and maintenance

The gas vents will be inspected with the same frequency as the landfill cap, for signs of damage or obstruction. Damaged or obstructed vents will be repaired or cleared promptly.

The perimeter gas monitoring wells will be sampled in accordance with the Post-Construction Environmental Monitoring Plan. Perimeter gas monitoring wells will be repaired or replaced promptly, if necessary, to the extent required to maintain proper function.

## 2.7. Run-on/run-off controls

### 2.7.1. Description

Run-on/run-off control for the cap has been provided for the 24-hr, 100-yr storm.

Run-on to the site from the west is intercepted by a berm along the western property boundary. Run-on is diverted to either a 21-inch culvert beneath Hathaway Road in the northwest corner of the site, or to one of the rip-rap lined swales along the southern boundary of the site. It should be noted that the majority of run-on from the west will be intercepted by the pre-existing storm sewer system in the parking lot to the west of the site.

Run-on to the site from the southwest and south is intercepted by the former southern tributary swale, which empties to Vault 1 and the Unnamed Stream by way of a 24-inch RCP culvert.

Run-on to the site from the east is intercepted by a berm and a swale which run parallel to the eastern boundary of the site. The swale discharges to Vault 2 and the Unnamed Stream by way of a 24-inch RCP culvert.

Run-on to the site from the north is intercepted by the curb in Hathaway Road and a series of catch basins along Hathaway Road. These catch basins discharge to the Unnamed Stream via the New Bedford storm sewer system or by way of Vault 2.

Run-off from the site is collected by rip-rap lined run-off collection swales along the northern, eastern, and southern boundaries of the site. All run-off storm water from the cap system is conveyed by these rip-rap lined swales and to the inlet structure at Vault 2. Run-off water from the cap then flows from Vault 2 to the sedimentation basin located north of Hathaway Road. From the sedimentation basin, storm water is released to the unnamed stream.

### 2.7.2. Inspection and maintenance

Run-on/run-off controls, including swales, berms, catchbasins, vaults, headwalls, and the sedimentation basin, will be inspected at the same frequency as the cover. Drainage facilities will be inspected for accumulation of debris and obstructions, including silt and vegetation which may inhibit flow, and for excessive scouring, which may erode ditches, swales, and berms. Debris and obstructions found in drainage facilities will be removed promptly to maintain flow capacity. If excessive scouring is noted, channel protection, consisting of rip-rap and/or geosynthetic materials, will be implemented to augment the existing system. Where swales and berms are vegetated, the vegetation will be inspected and maintained as described under the section titled "Landfill Cap."

## 2.8. Lined portion of un-named stream

### 2.8.1. Description

During the remedial construction, the un-named stream along the eastern boundary of the Disposal Area was lined by placing the stream within a 72-inch Pre-Stresssed Concrete Cylinder Pipe (72- inch PCCP). This portion of the stream was lined to prevent communication between stream water and ground water. The lining system begins at the former highway embankment headwall at the southeast corner of the site, and from south to north includes one 20-ft section of 72-inch PCCP, Vault 1, approximately 679 ft of 72-inch PCCP, and Vault 2.

### 2.8.2. Inspection and maintenance

The lined portion of the un-named stream will be inspected once every five years for integrity. Repairs, if necessary, will be made as appropriate.

## 3. Institutional controls

Section VIII.A of the Operable Unit 1 Statement of Work requires that the following institutional controls be applied to the First Operable Unit:

1. *Submission of notices to local authorities in accordance with the requirements of 40 CFR 254.119(a).*

2. *Recording of a notice conforming to the requirements of 40 CFR 264.119(b) with the Registry of Deeds, Bristol County, for all property included in the First Operable Unit.*

3. *Enactment of zoning restrictions for property within the Disposal Area to prohibit residential use of property within the Disposal Area.*

4. *Securing any and all appropriate actions by the New Bedford City Council, and other agencies or departments of the City of New Bedford, to restrict the use of ground water within the Site as a drinking water source.*

5. *Restrictions relating to property within the Disposal Area, in a document to be filed with the Registry of Deeds, Bristol County. Such restrictions shall run with the land and shall be binding upon any and all persons who subsequently acquire any interest or portion thereof, to the extent permitted under Massachusetts law.*

    a. *The Disposal Area shall not be developed for residential use.*

    b. *All plans for development of the property shall be submitted to USEPA for approval, in consultation with DEP.*

    c. *Ground water underlying the Disposal Area as defined in this SOW, shall not be withdrawn for any purpose, unless otherwise provided for in this SOW. Ground water supply wells shall not be installed on any part of the Site.*

    d. *Contaminated soils and sediments shall not be disturbed, except pursuant to a plan approved by USEPA, in consultation with DEP.*

    e. *The cap to be constructed over the Disposal Area and other ground-covering features of the remedy shall not be disturbed or modified in any manner, and no action*

*shall be taken which shall disturb in any manner the integrity or effectiveness of the cover.*

*f. No use or activity shall be permitted on the Disposal Area, unless otherwise provided for in this SOW, which will disturb any of the remedial measures implemented at the Site including without limitation: the collection, containment, treatment, and discharge of ground water; the excavation, dewatering, storage, treatment, and disposal of soils and sediments; and long-term monitoring of ground water, soils, sediments and wetlands.*

*g. Surficial regrading is permitted, but no intrusive earthwork activities beyond six inches shall be conducted. Any landscaping shall be done by bringing fill on the Disposal Area.*

*6. Restrictions relating to property which is part of the Site but is outside the Disposal Area, and specifically including contaminated areas within the Whaling City Golf Course, in a document to be filed with the Registry of Deeds, Bristol County. Such restrictions shall run with the land and shall be binding upon any and all persons who subsequently acquire any interest or portion thereof, to the extent permitted under Massachusetts Law.*

*a. All plans for development of the property shall be submitted to USEPA for approval.*

*b. Ground water underlying the Site shall not be withdrawn for any purpose unless otherwise provided in this SOW. Ground water supply wells shall not be installed on any part of the Site.*

*c. Earthwork activities in areas of soil contamination, including landscaping, may only include surficial regrading. No intrusive earthwork activities beyond six inches shall be conducted, except pursuant to a plan approved by USEPA.*

*d. No use or activity shall be permitted on the First Operable Unit, unless otherwise provided for in this SOW, which will disturb any of the remedial measures implemented at the Site including without limitation: the collection, containment, treatment, and discharge of ground water; the excavation, dewatering, storage, treatment, and disposal of soils and sediments; and long-term monitoring of ground water, soils, sediments and wetlands.*

e. *Contaminated soils and sediments shall not be disturbed, except pursuant to a plan approved by USEPA.*

Reports describing the results of the monitoring of implementation and effectiveness of the institutional controls specified in Section VII.A of the SOW will be submitted to USEPA on a yearly basis.

## 4. Maintenance of records

In accordance with Section C.1.j.ii.k of the Statement of Work, the following records for all current structures and equipment remaining on site or used as components of response activities or during operation and maintenance shall be maintained at the site:

1. Date of purchase
2. Maintenance procedures
3. Repair history
4. Warranties
5. Names of service representatives

Material of this nature related to ground water recovery and treatment equipment has been provided in files at the ground water treatment plant. For site/civil components of the remedy, material provided at the ground water treatment plant files includes record drawings and a copy of the Operable Unit 1 Remedial Construction Report, which includes information pertaining to installed materials and equipment.

In addition, one copy of each completed site inspection checklist will be maintained on-site at the ground water treatment plant while a second copy of each completed site inspection checklist will be provided to the designated representative(s) of the Sullivan's Ledge Site Group.

Table 2-1. Inspection Checklist.

Date Performed: Weather:

Site Name: Sullivan's Ledge Superfund Site Inspector Name:

Site Location: New Bedford, MA Inspector Signature:

| Item | Task | Response | | Comments (Attach additional sheets if necessary) |
|---|---|---|---|---|
| | | Yes | No | |
| **Landfill Cap** | **Visually inspect surface conditions.** | | | |
| | 1. Areas of erosion? | | | |
| | 2. Lack or thinning vegetation? | | | |
| | 3. Mowing required? | | | |
| | 4. Drainage problems? | | | |
| | 5. Areas of settlement? | | | |
| | 6. Areas of slope instability? | | | |
| | 7. Areas of damage? | | | |
| | 8. Presence of burrowing animals? | | | |
| | 9. Areas of seepage present? | | | |
| **Surveyed Benchmarks** | **Visually inspect** | | | |
| | 1. Signs of damage or disturbance | | | |
| | a. North of Vault 2 | | | |
| | b. At GWTP | | | |
| | c. Near Vault 1 | | | |

Table 2-1. Inspection Checklist.

Date Performed: Weather:

Site Name: Sullivan's Ledge Superfund Site Inspector Name:

Site Location: New Bedford, MA Inspector Signature:

| Item | Task | Response | | Comments (Attach additional sheets if necessary) |
|---|---|---|---|---|
| | | Yes | No | |
| **Access Road** | **Visually inspect surface conditions of access roads.** | | | |
| | 1. Cracks? | | | |
| | 2. Potholes? | | | |
| | 3. Settlement? | | | |
| | 4. Erosion? | | | |
| | 5. Areas of damage? | | | |
| **Site Security** | **Visually inspect fences and gates.** | | | |
| | 1. Signs intact? | | | |
| | 2. Fence damaged or breached? | | | |
| | 3. Access gates locked? Locks intact and operational? | | | |
| | a. South gate | | | |
| | b. East gate | | | |
| | c. GWTP west gate | | | |
| | d. GWTP east gate | | | |

Table 2-1. Inspection Checklist.

Date Performed: Weather:

Site Name: Sullivan's Ledge Superfund Site Inspector Name:

Site Location: New Bedford, MA Inspector Signature:

| Item | Task | Response | | Comments |
|---|---|---|---|---|
| | | Yes | No | |
| **Gas Venting System** | **Visually inspect surface conditions** | | | |
| | 1. Gas vents damaged? | | | |
| | 2. Perimeter monitoring wells damaged? | | | |
| **Run-on/run-off Controls** | **Visually inspect swales and culverts.** | | | |
| | 1. Accumulation of debris/excessive scouring/areas of damage? | | | |
| | a. Southern swale and culvert | | | |
| | b. Vault 1 east culvert | | | |
| | c. Southern cap swale | | | |
| | d. Eastern cap swale/berm | | | |
| | e. Northern cap swale | | | |
| | f. Three 12-inch culverts | | | |
| | g. Vault 2 inlet (top) | | | |
| | h. Vault 2 inlet (east) | | | |
| | i. Hathaway Road catch basins (3) | | | |
| | j. Hathaway Road headwall/basin | | | |

Table 2-1. Inspection Checklist.

Date Performed: Weather:

Site Name: Sullivan's Ledge Superfund Site Inspector Name:

Site Location: New Bedford, MA Inspector Signature:

| Item | Task | Response | | Comments |
|---|---|---|---|---|
| | | Yes | No | |
| **Run-on/run-off Controls (Cont'd)** | **Visually inspect swales and culverts.** | | | |
| | k. Tributary 2 culverts | | | |
| | l. 36-inch sediment basin culvert | | | |
| | m. Sedimentation basin | | | |
| | n. Sediment basin drain culvert | | | |
| | o. Hathaway Road box culverts | | | |
| | p. Un-named Stream | | | |
| | q. Diversion swale | | | |
| | r. Stream/diversion swale confluence | | | |
| | s. Sixth fairway box culvert | | | |
| | t. Entrance to Pond A | | | |
| | u. Exit of Pond B | | | |

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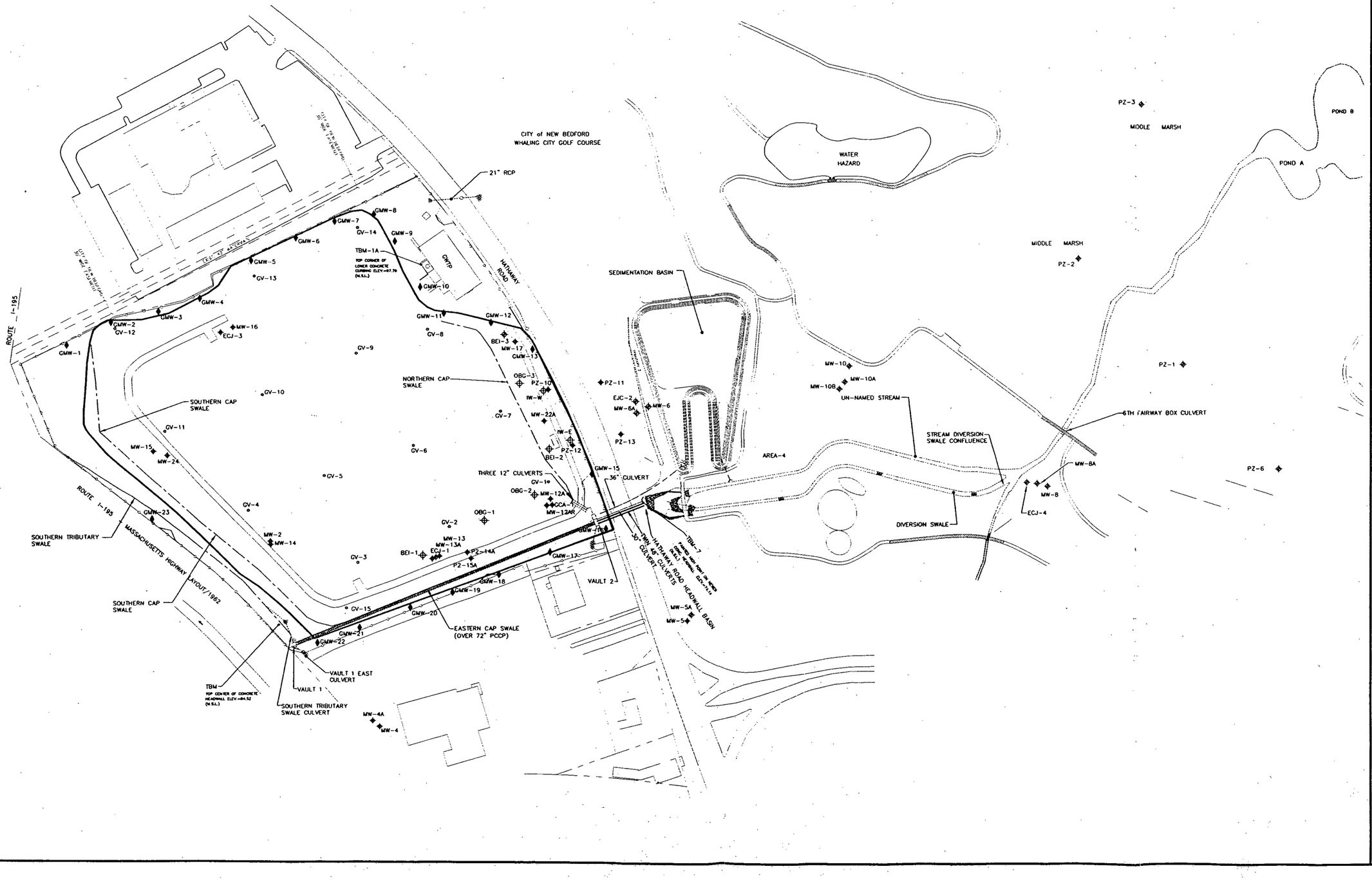
PLOT DATE: 2/20/02

FIGURE 1




## LEGEND

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- LIMITS OF CAP SYSTEM
- GAS VENT LOCATION
- GAS MONITORING WELL LOCATION
- CHAIN LINK FENCE
- SWALE CENTER LINE

SULLIVAN'S LEDGE SUPERFUND SITE
NEW BEDFORD, MASS.

# SITE MAP

# SITE OPERATIONS AND MAINTENANCE PLAN

NOT FOR CONSTRUCTION

1"=100' 100 0 100

5509.005-011
FEBRUARY 2002

O'BRIEN & GERE ENGINEERS, INC.

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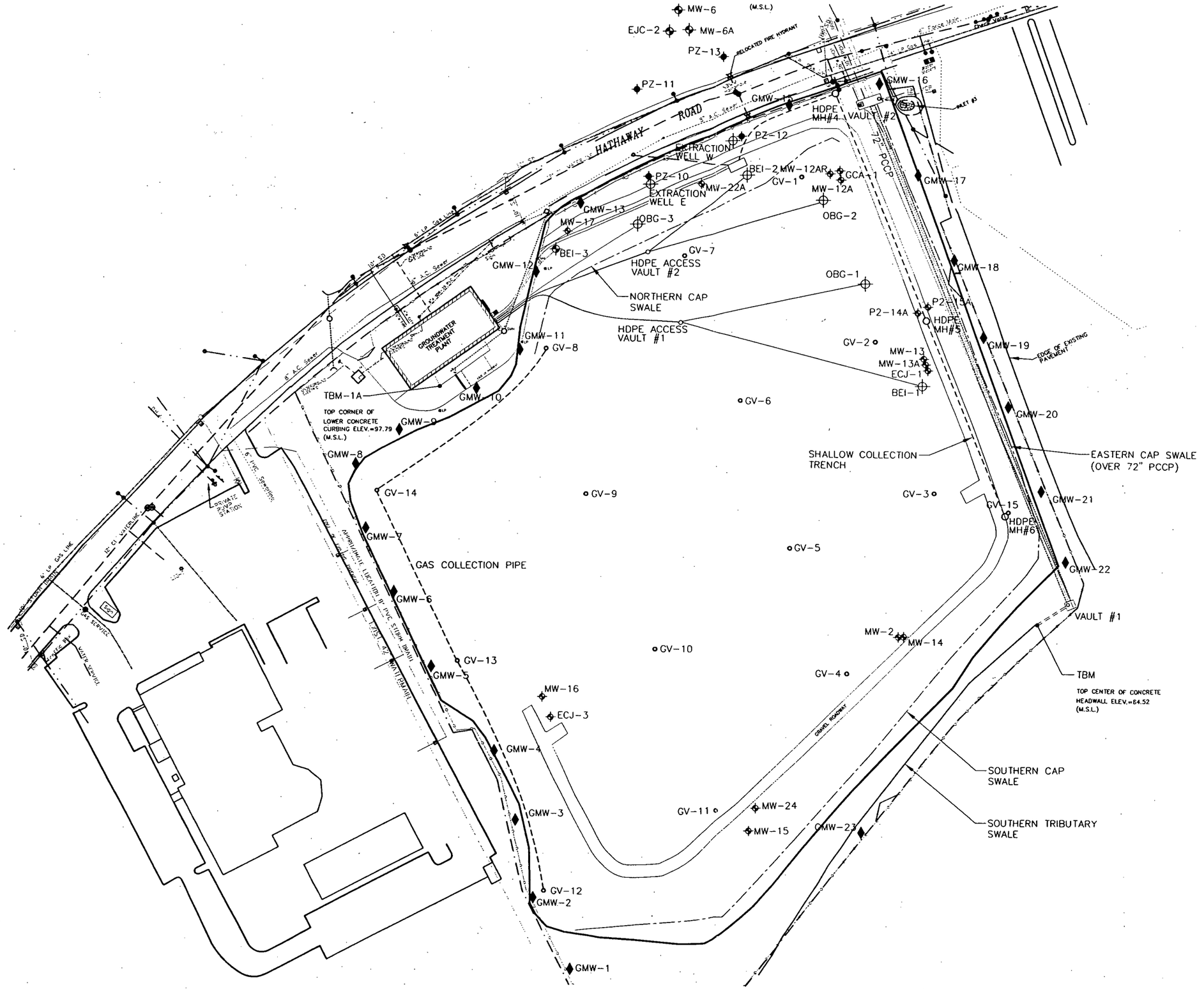


FIGURE 2

## LEGEND

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- LIMITS OF CAP SYSTEM
- GAS VENT LOCATION
- GAS MONITORING WELL LOCATION
- CHAIN LINK FENCE
- SWALE CENTER LINE
- GAS COLLECTION PIPE
- PROPERTY BOUNDARY
- PIPING TO PLANT
- STORM DRAIN SYSTEM
- SHALLOW COLLECTION TRENCH
- LIMITS OF CAP

SULLIVAN'S LEDGE SUPERFUND SITE
NEW BEDFORD, MASS.

DISPOSAL AREA SITE CAP

# SITE OPERATIONS AND MAINTENANCE PLAN

NOT FOR CONSTRUCTION

1"=60' 60 0 60

5509.005-010
JANUARY 2002

O'BRIEN & GERE ENGINEERS, INC.

PLOT DATE: 2/6/02

# Cited regulations

## 40 CFR 761.75 Chemical waste landfills.

This section applies to facilities used to dispose of PCBs in accordance with the part.

[49 FR 28172, July 10, 1984]

(a) *General.* A chemical waste landfill used for the disposal of PCBs and PCB Items shall be approved by the Agency Regional Administrator pursuant to paragraph (c) of this section. The landfill shall meet all of the requirements specified in paragraph (b) of this section, unless a waiver from these requirements is obtained pursuant to paragraph (c)(4) of this section. In addition, the landfill shall meet any other requirements that may be prescribed pursuant to paragraph (c)(3) of this section.

(b) *Technical requirements.* Requirements for chemical waste landfills used for the disposal of PCBs and PCB Items are as follows:

(1) *Soils.* The landfill site shall be located in thick, relatively impermeable formations such as large-area clay pans. Where this is not possible, the soil shall have a high clay and silt content with the following parameters:

(i) In-place soil thickness, 4 feet or compacted soil liner thickness, 3 feet;

(ii) Permeability (cm/sec), equal to or less than $1 \cdot 10^{-7}$;

(iii) Percent soil passing No. 200 Sieve, >30;

(iv) Liquid Limit, >30; and

(v) Plasticity Index >15.

(2) *Synthetic membrane liners.* Synthetic membrane liners shall be used when, in the judgment of the Regional Administrator, the hydrologic or geologic conditions at the landfill require such a liner in order to provide at least a permeability equivalent to the soils in paragraph (b)(1) of this section. Whenever a synthetic liner is used at a landfill site, special precautions shall be taken to insure that its integrity is maintained and that it is chemically compatible with PCBs. Adequate soil underlining and soil cover shall be provided to prevent excessive stress on the liner and to prevent rupture of the liner. The liner must have a minimum thickness of 30 mils.

(3) *Hydrologic conditions.* The bottom of the landfill shall be above the historical high groundwater table as provided below. Floodplains, shorelands, and groundwater recharge areas shall be avoided. There shall be no hydraulic connection between the site and standing or flowing surface water. The site shall have monitoring wells and leachate collection. The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table.

(4) *Flood protection.*

 

(i) If the landfill site is below the 100- year floodwater elevation, the operator shall provide surface water diversion dikes around the perimeter of the landfill site with a minimum height equal to two feet above the 100-year floodwater elevation.

(ii) If the landfill site is above the 100- year floodwater elevation, the operators shall provide diversion structures capable of diverting all of the surface water runoff from a 24-hour, 25-year storm.

(5) *Topography.* The landfill site shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping.

(6) *Monitoring systems—*

(i) *Water sampling.*

(A) For all sites receiving PCBs, the ground and surface water from the disposal site area shall be sampled prior to commencing operations under an approval provided in paragraph (c) of this section for use as baseline data.

(B) Any surface watercourse designated by the Regional Administrator using the authority provided in paragraph (c)(3)(ii) of this section shall be sampled at least monthly when the landfill is being used for disposal operations.

(C) Any surface watercourse designated by the Regional Administrator using the authority provided in paragraph (c)(3)(ii) of this section shall be sampled for a time period specified by the Regional Administrator on a frequency of no less than once every six months after final closure of the disposal area.

(ii) *Groundwater monitor wells.*

(A) If underlying earth materials are homogenous, impermeable, and uniformly sloping in one direction, only three sampling points shall be necessary. These three points shall be equally spaced on a line through the center of the disposal area and extending from the area of highest water table elevation to the area of the lowest water table elevation on the property.

(B) All monitor wells shall be cased and the annular space between the monitor zone (zone of saturation) and the surface shall be completely backfilled with Portland cement or an equivalent material and plugged with Portland cement to effectively prevent percolation of surface water into the well bore. The well opening at the surface shall have a removable cap to provide access and to prevent entrance of rainfall or stormwater runoff. The well shall be pumped to remove the volume of liquid initially contained in the well before obtaining a sample for analysis. The discharge shall be treated to meet applicable State or Federal discharge standards or recycled to the chemical waste landfill.

(iii) *Water analysis.* As a minimum, all samples shall be analyzed for the following parameters,

 

and all data and records of the sampling and analysis shall be maintained as required in § 761.80(d)(1). Sampling methods and analytical procedures for these parameters shall comply with those specified in 40 CFR Part 136 as amended in 41 FR 52779 on December 1, 1976.

[53 FR 12524, April 15, 1988]

(A) PCBs.

(B) pH.

(C) Specific conductance.

(D) Chlorinated organics.

(7) *Leachate collection.* A leachate collection monitoring system shall be installed above the chemical waste landfill. Leachate collection systems shall be monitored monthly for quantity and physicochemical characteristics of leachate produced. The leachate should be either treated to acceptable limits for discharge in accordance with a State or Federal permit or disposed of by another State or Federally approved method. Water analysis shall be conducted as provided in paragraph (b)(6)(iii) of this section. Acceptable leachate monitoring/collection systems shall be any of the following designs, unless a waiver is obtained pursuant to paragraph (c)(4) of this section.

(i) *Simple leachate collection.* This system consists of a gravity flow drainfield installed above the waste disposal facility liner. This design is recommended for use when semi-solid or leachable solid wastes are placed in a lined pit excavated into a relatively thick, unsaturated, homogenous layer of low permeability soil.

(ii) *Compound leachate collection.* This system consists of a gravity flow drainfield installed above the waste disposal facility liner and above a secondary installed liner. This design is recommended for use when semi-liquid or leachable solid wastes are placed in a lined pit excavated into relatively permeable soil.

(iii) *Suction lysimeters.* This system consists of a network of porous ceramic cups connected by hoses/tubing to a vacuum pump. The porous ceramic cups or suction lysimeters are installed along the sides and under the bottom of the waste disposal facility liner. This type of system works best when installed in a relatively permeable unsaturated soil immediately adjacent to the bottom and/or sides of the disposal facility.

(8) *Chemical waste landfill operations.*

(i) PCBs and PCB Items shall be placed in a landfill in a manner that will prevent damage to containers or articles. Other wastes placed in the landfill that are not chemically compatible with PCBs and PCB Items including organic solvents shall be segregated from the PCBs throughout the waste handling and disposal process.

 

(ii) An operation plan shall be developed and submitted to the Regional Administrator for approval as required in paragraph (c) of this section. This plan shall include detailed explanations of the procedures to be used for recordkeeping, surface water handling procedures, excavation and backfilling, waste segregation burial coordinates, vehicle and equipment movement, use of roadways, leachate collection systems, sampling and monitoring procedures, monitoring wells, environmental emergency contingency plans, and security measures to protect against vandalism and unauthorized waste placements. EPA guidelines entitled "Thermal Processing and Land Disposal of Solid Waste" (39 FR 29337, Aug. 14, 1974) are a useful reference in preparation of this plan. If the facility is to be used to dispose of liquid wastes containing between 50 ppm and 500 ppm PCB, the operations plan must include procedures to determine that liquid PCBs to be disposed of at the landfill do not exceed 500 ppm PCB and measures to prevent the migration of PCBs from the landfill. Bulk liquids not exceeding 500 ppm PCBs may be disposed of provided such waste is pretreated and/or stabilized (e.g., chemically fixed, evaporated, mixed with dry inert absorbant) to reduce its liquid content or increase its solid content so that a non- flowing consistency is achieved to eliminate the presence of free liquids prior to final disposal in a landfill. PCB Container of liquid PCBs with a concentration between 50 and 500 ppm PCB may be disposed of if each container is surrounded by an amount of inert sorbant material capable of absorbing all of the liquid contents of the container.

(iii) Ignitable wastes shall not be disposed of in chemical waste landfills. Liquid ignitable wastes are wastes that have a flash point less than 60 degrees C (140 degrees F) as determined by the following method or an equivalent method: Flash point of liquids shall be determined by a Pensky-Martens Closed Cup Tester, using the protocol specified in ASTM Standard D 93-90, or the Setaflash Closed Tester using the protocol specified in ASTM Standard D 3278-89.

[48 FR 5729, Feb. 8, 1983; 53 FR 21641 , June 9, 1988; 57 FR 13323 , April 16, 1992]

(iv) Records shall be maintained for all PCB disposal operations and shall include information on the PCB concentration in liquid wastes and the three dimensional burial coordinates for PCBs and PCB Items. Additional records shall be developed and maintained as required in § 761.80.

[53 FR 12524, April 15, 1988]

(9) *Supporting facilities.*

(i) A six foot woven mesh fence, wall, or similar device shall be placed around the site to prevent unauthorized persons and animals from entering. 2.5

(ii) Roads shall be maintained to and within the site which are adequate to support the operation and maintenance of the site without causing safety or nuisance problems or hazardous conditions. 2.4

(iii) The site shall be operated and maintained in a manner to prevent safety problems or hazardous conditions resulting from spilled liquids and windblown materials. 2.4, 2.5

 

compliance with the requirements of 310 CMR 30.000 and of the approved closure plan, and

(b) the survey plat required by 310 CMR 30.586 has been recorded in the appropriate Registry of Deeds or, if the land in question is registered land, in the registry section of the land court for the district wherein the land lies, and copies of the plat have been submitted to the Department and to the Board of Health of the city or town wherein the land lies, in compliance with 310 CMR 30.586.

(2) Until the Department, pursuant to 310 CMR 30.904(8), notifies the owner or operator in writing that he is no longer required to maintain financial assurance for closure of the facility, the owner or owner and the independent Massachusetts registered professional engineer who signed the certification required pursuant to 310 CMR 30.587(1) shall each promptly submit to the Department on request any documentation supporting said certification.

(3) Closure shall not be considered complete until so certified in writing by the Department.

**30.588 - 30.589: [Reserved]**

**30.590: Post-Closure**

**30.591A: Applicability**

[Effective through June 30, 1988]

The post-closure requirements in 310 CMR 30.590 through 30.595 apply to the owners and operators of all facilities at which hazardous waste will remain after closure.

**30.591B: Applicability**

[Effective on and after July 1, 1988]

The requirements in 310 CMR 30.590 through 30.596, cited collectively as 310 CMR 30.590, apply to the owners and operators of all hazardous waste management units and facilities at which hazardous waste will remain after closure.

**30.592: Post-Closure Care and Use of Property**

(Effective on and after July 1, 1988)

(1) Post-closure care for each hazardous waste management unit subject to the requirements of 310 CMR 30.590 shall begin after completion of closure of the unit, shall continue for 30 years after that date, and shall consist of at least the following:

(a) Monitoring and reporting in accordance with the requirements set forth in 310 CMR 30.610 through 30.679.

 

(b) Maintenance and monitoring of waste containment systems in accordance with the requirements set forth in 310 CMR 30.610 through 30.679.

(2) At any time preceding completion of closure of a particular hazardous waste management unit subject to the requirements of 310 CMR 30.590, or at any time during the post-closure period of that hazardous waste management unit or facility, the Department may shorten the post-closure period applicable to that hazardous waste management unit or facility

(a) if all hazardous waste management units or facilities have been closed, and

(b) if the Department determines that such action is sufficient to protect public health, safety, or welfare, or the environment (e.g., leachate or ground water monitoring results, characteristics of the hazardous wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is and would continue to be secure), and

(c) if the owner or operator requests the Department to take such action by filing an application that complies with the requirements in 310 CMR 30.082 through 30.807, and

(d) only after the Department complies with the requirements and procedures set forth in 310 CMR 30.851 and 30.852, and, if applicable, 310 CMR 30.833, 30.835, 30.836, 30.837, and 30.839, and

(e) if such action is accordance with all other applicable provisions of 310 CMR 30.800.

(3) At any time preceding completion of closure of a particular hazardous waste management unit or facility subject to the requirements of 310 CMR 30.590, or at any time during the post-closure period of that hazardous waste management unit or facility, the Department may extend the post-closure period applicable to that hazardous waste management unit or facility

(a) if the Department determines that such action is necessary to protect public health, safety, or welfare, or the environment (e.g., leachate or ground water monitoring results indicate a potential for migration of hazardous wastes at levels which might be harmful to public health, safety, or welfare, or the environment), and

(b) after the Department complies with the requirements and procedures set forth in 310 CMR 30.851 and 30.852, and, if applicable, 310 CMR 30.833, 30.835, 30.836, 30.837, and 30.839, except as provided in 310 CMR 30.020 and 30.030, and

(c) if such action is accordance with all other applicable provisions of 310 CMR 30.800.

(4) The Department may require continuation, after closure, of any of the security requirements of 310 CMR 30.514 during part or all of the post-closure period if:

 

(a) Hazardous wastes might remain exposed after completion of closure, or

(b) Access by the public or domestic livestock might pose a hazard to public health, safety, or welfare, or the environment.

(5) Post-closure use of property on or in which hazardous wastes remain after closure shall never be allowed to disturb the integrity of the final cover, liner(s), or any other components of any containment system, or the function of the facility's monitoring systems, unless the Department determines in writing that the disturbance:

(a) Is necessary to the proposed use of the property and will not increase the potential hazard to public health, safety, or welfare or the environment; or

(b) Is necessary to reduce a threat to public health, safety or welfare or the environment.

(6) All post-closure care activities shall be in compliance with the provisions of the approved post-closure plan as specified in 310 CMR 30.593.

**30.593: Post-Closure Plan**

(Effective on and after July 1, 1988)

(1) The owner or operator of a hazardous waste management unit or facility subject to the requirements of 310 CMR 30.590 shall have a written post-closure plan that complies with the requirements of 310 CMR 30.590. The owner or operator of a facility at which there is a surface impoundment described in 310 CMR 30.617(5) or a waste pile described in 310 CMR 30.649(3) from which the owner or operator intends to remove all hazardous waste at closure shall have a contingent post-closure plan that complies with the requirements of 310 CMR 30.590 and, as applicable, in 310 CMR 30.617(5) and 30.649(3). Owners or operators of surface impoundments or waste piles not otherwise required to have contingent post-closure plans shall submit a post-closure plan to the Department within 90 days after the owner or operator or the Department determines that the surface impoundment or waste pile shall be closed as a landfill. Each post-closure plan shall identify the activities that shall, and each contingent post-closure plan shall identify the activities that might, be carried on after closure and the frequency of these activities, and shall include at least:

(a) A description of the planned monitoring activities and frequencies at which they will be performed to comply with the requirements set forth in 310 CMR 30.610 through 30.679, and

(b) A description of the planned maintenance activities, and frequencies at which they will be performed, to ensure:

1. The integrity of the cap and final cover or other containment systems in accordance with the requirements set forth in 310 CMR 30.610 through 30.659, and

 

2. The function of the monitoring equipment in accordance with the requirements set forth in 310 CMR 30.610 through 30.679, and

(c) The name, address, and telephone number of the person or office to contact about the hazardous waste management unit or facility during the post-closure care period. This individual or office shall keep at all times during the post-closure period an updated copy of the approved post-closure plan.

(2) Amendments of post-closure plans shall be subject to the following provisions.

(a) All applications to the Department for approval to amend a facility's post-closure plan shall include a copy of the proposed amended post-closure plan. The owner or operator shall submit a written notification of or request for a license modification to authorize a change in the approved post-closure plan in compliance with 310 CMR 30.802 through 30.807. The Department shall classify the proposed amendment in accordance with 310 CMR 30.852. The Department shall act in accordance with the requirements and procedures set forth in 310 CMR 30.852.

(b) The owner or operator may apply to the Department for approval to amend the facility's post-closure plan at any time during the active life of the facility or during the post-closure care period. Except as provided in 310 CMR 30.852 and 30.890, denial of an application to amend a post-closure plan shall not be subject to public notice, public comment, or public hearings.

(c) The owner or operator shall apply to the Department for approval to amend the facility's post-closure plan whenever

1. changes in operating plans or facility design affect the post-closure plan, or

2. there is a change in the expected year of final closure, if applicable, or

3. events which occur during the active life of the facility, including but not limited to closures (and changes in applicable regulations when published in the Massachusetts Register), require a modification of the approved post-closure plan, or

4. the Department requests or orders an amendment of the facility's post-closure plan.

(d) The deadline for the owner or operator to file required applications to the Department for approval to amend the facility's post-closure plan shall be as follows:

1. At least 60 days prior to a proposed change in facility design or operation.

2. Not more than 60 days after an unexpected event has occurred (including, but not limited to, a change in applicable regulations when published in the Massachusetts Register that affects the post-closure plan.

3. Not more than 60 days after the Department requests or orders an amendment of the

 

facility's closure plan, or 90 days if the hazardous waste management unit is a surface impoundment or waste pile not previously required to prepare a contingent post-closure plan.

**30.594: Recording Notice Of License And Of Past Disposal**

(1) Within sixty (60) days of certification of closure of the first hazardous waste management unit subject to the requirements of 310 CMR 30.590, and within sixty (60) days of certification of closure of the last hazardous waste management unit subject to the requirements of 310 CMR 30.590, the owner or operator shall record in the appropriate Registry of Deeds or, if the land in question is registered land, in the registry section of the land court for the question is registered land, in the registry section of the land court for the district wherein the land lies, a notice that:

(a) the land has been used to manage hazardous wastes, and

(b) the land's use is restricted pursuant to 310 CMR 30.592(5), and

(c) the survey plat and record required by 310 CMR 30.586 have been recorded in the Registry of Deeds and copies thereof have been submitted to the Department and to the Board of Health of the city or town wherein the land lies.

(2) The landowner shall submit to the Department a certified copy of each notice described in 30.594(1), including the date and book and page numbers of recording of such notice, within thirty (30) days after the landowner receives the recorded notice from the registry.

**30.595: Subsequent Removal Of Hazardous Waste And Hazardous Waste Containment Systems**

(1) If the owner or operator or any subsequent owner or operator of the land upon which is located a hazardous waste management unit or facility subject to the requirements of 310 CMR 30.590 wishes to remove hazardous wastes, hazardous waste residues, the liner if any, or contaminated soils, he shall apply to the Department for approval to do so. The Department may grant such approval but

(a) only if the owner or operator applies for such approval in compliance with the requirements and procedures set forth in 310 CMR 30.802 through 30.807, and

(b) only after the Department complies with the requirements and procedures set forth in 310 CMR 30.851 and 30.852, and, if applicable, 310 CMR 30.833, 30.835, 30.836, 30.837, and 30.839, and

(c) such approval shall be subject to all other applicable provisions of 310 CMR 30.800, and

(d) in addition, such approval may be granted, and may be allowed to remain in effect, only if the owner or operator has persuaded the Department that the removal of the material in question will be in compliance with the requirements set forth in 310 CMR 30.592(5).

 

(2) If the Department grants the approval described in 310 CMR 30.595(1), the person granted such approval may request that the Department give written verification of such removal. If the Department verifies in writing that the material in question has been removed in compliance with such approval, the person requesting the verification may record that verification in the appropriate Registry of Deeds or, if the land in question is registered land, in the registry section of the land court for the district wherein the land lies.

 

**30.596: Completion And Certification Of Post-Closure Care**

[Effective on and after July 1, 1988]

(1) No later than sixty (60) days after completion of the established post-closure care period for each hazardous waste management unit or facility subject to the requirements of 310 CMR 30.590, the owner or operator shall submit to the Department, either by hand-delivery or by certified mail, a certification signed by both the owner or operator and by an independent Massachusetts registered professional engineer that

(a) post-closure care was performed for the hazardous waste management unit or facility, as applicable, for the required period in compliance with the requirements of 310 CMR 30.000 and of the approved post-closure plan, and

(b) the survey plat required by 310 CMR 30.586 has been recorded in the appropriate Registry of Deeds or, if the land in question is registered land, in the registry section of the land court for the district wherein the land lies, and copies of the plat have been submitted to the Department and to the Board of Health of the city or town wherein the land lies, in compliance with 310 CMR 30.586.

(c) the notices required by 310 CMR 30.040 and 30.594 have been recorded in the appropriate Registry of Deeds or, if the land in question is registered land, in the registry section of the land court for the district wherein the land lies, and copies of the notices have been submitted to the Department in compliance with 310 CMR 30.040 and 30.594.

(2) Until the Department, pursuant to 310 CMR 30.906(8), notifies the owner or operator in writing that he is no longer required to maintain financial assurance for post-closure care of the facility, the owner or owner and the independent Massachusetts registered professional engineer who signed the certification required pursuant to 310 CMR 30.596(1) shall each promptly submit to the Department on request any documentation supporting said certification.

(3) Post-closure care shall not be considered complete until so certified in writing by the Department.

**30.597 - 30.599: [Reserved]**

 

post-closure care of an impoundment subject to 310 CMR 30.617(5) shall include the cost of complying with the expected closure plan, the contingent closure plan, and the contingent post-closure plan. Where the costs of the expected closure plan and the contingent closure plan overlap (i.e., the same items are factored into the cost estimate), the costs need not be counted twice.

**30.618: Stand-by Surface Impoundments - Waiver From Groundwater Monitoring Requirements**

(1) On a case-by-case basis, the Department may waive all or part of 310 CMR 30.660: Groundwater Protection for surface impoundments that are designed and operated solely for the containment of hazardous waste in the event of an emergency at the facility (e.g., equipment failure or overflows). If such a waiver is granted, the owner or operator shall:

(a) Immediately notify the Department by the quickest available means following an emergency which requires that the impoundment be utilized, and follows this up with a written notification within seven days; and

(b) Remove all waste from the impoundment as expeditiously as practicable and in a manner and time period approved by the Department.

(2) If the owner or operator fails to comply with 310 CMR 30.618(1)(a) or (b), the Department may require that the owner or operator comply with 310 CMR 30.660: Groundwater Protection.

(3) Nothing in 310 CMR 30.618 relieves the owner or operator from the responsibility to comply with any other provision of 310 CMR 30.610.

**30.620: Landfills**

**30.621: Applicability**

310 CMR 30.621 through 30.633, cited collectively as 310 CMR 30.620, prescribe requirements which apply to owners and operators of facilities that dispose of hazardous waste in landfills.

**30.622: Design And Operating Requirements**

(1) Each landfill shall be underlain by two liners which are designed and constructed in a manner that prevents the migration of liquids into or out of the space between the liners. The liners shall be designed, constructed and installed to prevent any migration of wastes out of the landfill to the adjacent groundwater, surface water or subsurface soil at any time during the active life and during the closure period of the landfill. The upper liner shall be constructed of materials that prevent waste from passing into the liner during the active life of the facility. Clay liners and

 

admixes shall not be acceptable. The bottom liner may be constructed of materials that allow waste to migrate into the liner itself but not into the groundwater, surface water or adjacent subsurface soil during the active life of the facility. The bottom liner shall have a hydraulic conductivity not to exceed 1 X $10^{-7}$ cm/sec. Each liner shall be:

(a) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to:

1. pressure gradients including static head and external hydrogeologic forces;

2. physical contact with and the chemical properties of the waste or leachate to which it is exposed;

3. climatic conditions;

4. exposure to ozone, ultraviolet light or microbes; and

5. the stress of installation and the stress of daily operation, including the use of machinery and equipment upon the liner after installation.

(b) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression or uplife: rocks, boulders, irregularities with sharp edges, and all material that may damage the liner shall be removed from the subgrade prior to installation of the liner; and

(c) Installed to cover all surrounding earth likely to be in contact with the waste or leachate.

(2) The bottom liner shall be at least four (4) feet above the probable high groundwater level as determined pursuant to 310 CMR 30.675. This shall not prohibit the owner or operator from installing passive systems designed to artificially lower the groundwater table throughout the operating life of the facility and beyond, provided that the facility's license specifically authorizes this.

(3) A leak detection, collection and removal system shall be designed, constructed, maintained and operated between the liners to detect, collect and remove all discharge of liquid into the space between the liners. The detection, collection and removal system shall be designed, constructed, operated and maintained so that leakage flows freely from the collection system and is removed either as it accumulates or with sufficient frequency to prevent backwater within the collection system. If liquid leaks into the leak detection, collection and removal system, the owner or operator shall:

(a) Notify the Department of the leak immediately by the quickest available means and also notify the Department in writing within 7 days; and

(b) Either:

 

1. Within the period of time which shall be specified by the Department:

a. Remove accumulated liquid;

b. To prevent the migration of liquids through the liner, repair or replace the liner which is leaking; and

c. Obtain a certification from an independent Massachusetts registered professional engineer that, to the best of his knowledge and opinion, the leak has been stopped; or

2. Ask the Department to determine that it is impractical to repair or replace the liner that is leaking, in which case the Department may authorize the owner or operator to continue operating the landfill but only if leakage is continually removed by the leakage detection, collection and removal system and 310 CMR 30.660 (Groundwater Protection) is complied with. In making such a determination, the Department may consider the following:

a. The type(s) and volume(s) of waste(s) in the landfill;

b. The ease with which the cause of the leak can be determined;

c. Safety hazards involved in removing hazardous waste from the landfill;

d. Availability of temporary storage areas for waste removed from the landfill; and

e. The types and concentrations of hazardous constituents appearing in the liquid which is leaking from the liner.

(4) The landfill shall have, immediately above the upper liner, a leachate collection and removal system that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill. The leachate depth over the liner at any point over the base of the landfill shall not exceed 30 cm. (one foot). If the collected leachate is hazardous waste pursuant to 310 CMR 30.100, it shall be managed as hazardous waste in compliance with 310 CMR 30.000. If the collected leachate is discharged to surface water or groundwater, such discharge is subject to M.G.L. c. 21, s. 43. The leachate collection and removal system shall be:

(a) Constructed of materials that are:

1. Chemically resistant to the waste managed in the landfill and to the leachate expected to be generated; and

2. Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying waste, waste cover material, and by any equipment used at the landfill; and

(b) Designed and operated to function without clogging through the active life and the closure and post-closure period of the landfill.

 

(5) The owner or operator shall design, construct, operate and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 100-year storm.

(6) The owner or operator shall design, construct, operate and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 100-year storm. If the collected run-off is hazardous waste pursuant to 310 CMR 30.100, it shall be managed as hazardous waste in compliance with 310 CMR 30.000. If the collected run-off is discharged to surface water or groundwater, such discharge is subject to M.G.L. c. 21, s. 43.

(7) To maintain design capacity of the system, collection and holding facilities (e.g., tanks, basins) associated with run-on and run-off control systems shall be emptied or otherwise managed expeditiously after storms.

(8) If a landfill contains any particulate matter which may be subject to wind dispersal, the owner or operator shall cover or otherwise manage the landfill to control wind dispersal.

(9) The owner or operator shall design and operate the facility so that, where necessary to protect public health, safety and welfare and the environment, the migration of toxic, ignitable or otherwise harmful emissions from the facility site shall be controlled.

(10) The owner or operator shall provide, and maintain in good repair, access roads at the landfill site. Such access roads shall be designed, constructed and maintained so that traffic will flow smoothly at all times and will not be interrupted by inclement weather.

(11) Landfills shall be equipped with suitable channeling devices, such as ditches, berms or settling basins, to prevent run-off originating from the landfill site which could cause interference with natural drainage of adjacent land(s).

**30.623: Demonstration Of Waste/Liner Compatibility**

Submitted with the license application shall be a demonstration that the waste(s) and leachate that may be in contact with the liners are compatible with the liner materials to be used. The license applicant shall persuade the Department that the wastes will not cause any detrimental effect (e.g., cause cracks, swelling, decrease in mechanical strength, change in chemical properties or increase in permeability) on the liner material(s) used to prevent leakage into or out of the space between the liners. This demonstration shall be made by:

(1) conducting field tests or laboratory tests which are approved by the Department; all such testing shall be fully documented and submitted with the license application; or

(2) submitting to the Department historical data which documents successful use of the particular liner material to be used with the waste(s) and leachate to which the liner materials will

 

be exposed; or

(3) submitting to the Department scientific and technical literature which demonstrates that the waste(s) and leachate will not adversely affect the liners.

**30.624: Monitoring And Inspection**

(1) During construction and installation, liners and cover systems (e.g., membranes, sheets and coatings) shall be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction and installation, each synthetic liner and cover shall be inspected, using methods acceptable to the Department, to ensure tight seams and joints and the absence of tears, punctures or blisters. Immediately after construction and installation, each soil-based and admixed liner and cover shall be inspected for imperfections, including lenses, cracks, channels, root holes, or other structural defects, that might cause an increase in the permeability of the liner or cover.

(2) After a liner has been installed and prior to introducing hazardous waste into the landfill, the owner or operator shall obtain from an independent Massachusetts registered professional engineer a certification which states that:

(a) The liner has been inspected in accordance with 310 CMR 30.624(1); and

(b) Each defect found has been properly repaired.

(3) While a landfill is in operation, it shall be inspected weekly and also immediately after storms to detect evidence of any of the following:

(a) Deterioration, malfunction, or improper operation of run-on and run-off control systems;

(b) The presence of liquids in leak detection, collection and removal systems installed to comply with 310 CMR 30.622(3);

(c) Proper functioning of wind dispersal control systems, where present;

(d) The presence of leachate in leachate collection and removal systems; and

(e) Proper functioning of leachate collection and removal systems.

(4) All inspections done pursuant to 310 CMR 30.624(3) shall be recorded in the log required pursuant to 310 CMR 30.515(1).

**30.625. Supervision Of Operation**

(1) During the period beginning with commencement of construction of each hazardous waste landfill and ending two years thereafter, there shall be in effect at all times a contract properly executed by the owner or operator and by an independent Massachusetts registered professional

 

engineer knowledgeable in matters of hazardous waste disposal. The owner or operator shall submit a copy of said contract to the Department with the license application. The contract shall provide for the following minimum requirements:

(a) During site preparation, the engineer shall provide sufficient supervision, assistance and inspection to enable him to certify that preparation of the site has been done in accordance with the plans which were approved by the Department.

(b) During the operation of the landfill,

1. The engineer shall provide daily supervision, engineering assistance, and plan interpretation during the first week of operation.

2. The engineer shall conduct monthly inspections during the first year of operation to ensure compliance with the approved plans.

3. Thereafter, the engineer shall conduct inspections of the landfill operation at least once every two (2) months.

(c) The engineer shall comply with 310 CMR 30.625(3) and (4).

(2) After expiration of the period specified in 310 CMR 30.625(1), there shall be in effect at all times a contract properly executed by the owner or operator and by an independent Massachusetts registered professional engineer knowledgeable in matters of hazardous waste disposal. The owner or operator shall submit to the Department a copy of each such contract. Each such contract shall provide for the following minimum requirements:

(a) The engineer shall conduct inspections at least once every two (2) months; and

(b) The engineer shall comply with 310 CMR 30.625(3) and (4).

(3) After each site inspection, the engineer shall prepare a written report for the owner or operator. This report shall be part of the facility's operating record and shall be kept in compliance with 310 CMR 30.541 through 30.543. The engineer shall also submit a copy of this report to the Department within fifteen (15) days of the inspection.

(4) The engineer shall promptly notify the Department of any and all deviations from the approved plans and operating procedure.

**30.626. Surveying And Record Keeping**

The owner or operator of a hazardous waste landfill shall maintain the following items in the operating record required pursuant to 310 CMR 30.542:

(1) On a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks; and

 

(2) The contents of each cell and the approximate location of each waste type within each cell.

**30.627: Equipment**

(1) The owner or operator shall provide equipment in adequate numbers and of appropriate type and size for the proper operation of the landfill in accordance with good engineering practice and in compliance with 310 CMR 30.000:

(2) The owner or operator shall make provisions for the routine maintenance of equipment and to assure satisfactory performance capability for the various operations necessary for excavation, compaction, transportation, covering and other aspects of a landfill, and for the prompt repair or replacement of said equipment.

(3) The owner or operator shall provide at the site suitable shelter or protection for all equipment and service supplies used in connection with landfill operation.

(4) The owner or operator shall make arrangements for providing standby equipment in the event of breakdown of regular equipment. Such standby equipment shall be available for use and shall be provided within twenty-four (24) hours of such breakdown; otherwise the landfill area shall be closed for receipt of waste until equipment becomes available.

**30.628: Special Requirements For Ignitable, Reactive, And Incompatible Hazardous Wastes, And Hazardous Wastes That Are Polyhalogenated Aromatic Hydrocarbons**

(1) Ignitable or reactive hazardous waste shall not be disposed of in a landfill.

(2) Incompatible hazardous wastes, or materials incompatible with hazardous wastes (see 310 CMR 30.561 for examples) shall not be placed in the same landfill cell unless 310 CMR 30.560(3) is complied with.

(3) Polyhalogenated aromatic hydrocarbons shall not be placed in a landfill except in accordance with all other applicable provisions of 310 CMR 30.620 and in accordance with the terms and conditions of a management plan, approved by the Department, for such placement. Compliance with such a plan, when approved, shall be a condition of a license issued pursuant to 310 CMR 30.000. The Department may approve a management plan for the placement of polyhalogenated aromatic hydrocarbons in a landfill only if, after considering at least the following criteria, the Department determines that such approval is in accordance with provisions set forth in 310 CMR 30.810 through 30.814.

(a) The volume and physical and chemical characteristics of the polyhalogenated aromatic hydrocarbons, including their potential to migrate through the soil or to volatilize or escape into the atmosphere.

(b) The volume and physical and chemical characteristics of the other materials placed into the

 

landfill, including their potential to migrate through the soil or to volatilize or escape into the atmosphere.

(c) The attenuative properties of the soil and other materials surrounding or underlying the landfill.

(d) The effectiveness of additional treatment, design, or monitoring techniques used by the owner or operator of the landfill. The Department may require the use of additional or different treatment, design, or monitoring techniques to reduce the possibility of migration or emission of these materials into ground water, surface water, soil, or air.

**30.629: Special Requirements For Liquid Waste**

(1) Non-containerized liquid waste or waste containing free liquids, in each case as determined in accordance with 310 CMR 30.156, shall not be placed in a landfill.

(2) A container holding liquid waste or waste containing free liquids, in each case as determined in accordance with 310 CMR 30.156, shall not be placed in a landfill.

(3) For purposes of 310 CMR 30.629.

(a) Wastes containing less than 20% solids by weight shall be considered liquids.

(b) Wastes which contain greater than 20% solids by weight shall be considered to contain free liquid if a 100 ml representative sample of such waste cannot be completely retained in a standard 400 micron conical paint filter for five (5) minutes without loss of any portion of the waste from the bottom of the filter. This test shall be performed at approximately 65 F. Alternate testing procedures may be used if approved by the Department.

(4) The owner or operator of a landfill shall include in the waste analysis plan required pursuant to 310 CMR 30.513 provisions for testing wastes to ensure that they do not contain free liquids.

**30.630: Special Requirements For Containers**

(1) An empty container shall be crushed flat, shredded, or similarly reduced in volume to the maximum practical extent or filled with solids before it is buried beneath the surface of a landfill.

(2) A partially empty container, before it is buried beneath the surface of a landfill, shall be:

(a) Filled with solids compatible with the wastes already in the container; or

(b) Crushed to the maximum practical extent to eliminate void spaces; or

(c) Emptied and the empty container crushed flat, or similarly reduced in volume.

 

(3) To be considered "filled with solids" in compliance with 310 CMR 30.630(1) or (2)(a), a container shall be filled in compliance with 310 CMR 30.630(3)(a) or (b), whichever results in less void space.

(a) The container shall be filled to within 7.6 centimeters (3 inches) of the top of the container, or

(b) The content of the container shall occupy 90% or more of the volume of the container.

(4) For the purposes of 310 CMR 30.630, the term "partially empty container" shall mean a container that is neither an empty container (see 310 CMR 30.010) or a container that is "filled with solids" [See 310 CMR 30.630(3)].

(5) Landfill disposal of containers of hazardous waste in other containers (e.g., lab packs) is prohibited.

**30.631: Wastes Unacceptable For Landfilling**

(1) Except as provided in 310 CMR 30.631(3), (4) or (5), the following wastes shall not be disposed of in a landfill:

(a) Any sludge or solid containing halogenated organic compounds in a concentration greater than 100 mg/kg;

(b) Any waste containing cyanide;

(c) Any waste which is acutely hazardous waste pursuant to 310 CMR 30.136.

(2) The Department may prohibit the disposal of any hazardous waste in a landfill if it determines that landfilling of such waste may present a hazard to public health, safety or welfare or the environment (e.g., volatile organics).

(3) On a case-by case basis, the Department may waive any provision of 310 CMR 30.631(1) if the Department determines that:

(a) The waste cannot be recycled, treated or disposed of by some other means in compliance with 310 CMR 30.000; and

(b) The type and volume of waste to be disposed of will not present any significant risk to public health, safety or welfare or the environment.

(4) On a case-by-case basis, the Department may waive any provision of 310 CMR 30.631(1) if the waste is a contaminated soil and the Department determines that the requirements set forth in 310 CMR 30.631(3)(a) and (b) are met.

 

(5) On a case-by-case basis, the Department may waive any provision of 310 CMR 30.631(1) if the waste has been absorbed by spill clean-up material and the Department determines that the requirements set forth in 310 CMR 30.631(3)(a) and (b) are met.

(6) The Department shall review the feasibility of available hazardous waste management alternatives for all hazardous wastes which the owner or operator proposes to dispose of at the landfill, as stated in the license application pursuant to 310 CMR 30.804(19)(a). The Department shall approve for landfill disposal only those hazardous wastes which cannot be reused, recycled, treated or disposed of by some other means in compliance with 310 CMR 30.000, or which the Department determines cannot be eliminated.

**30.632: Stabilization Solidification Plan**

(1) The owner or operator shall prepare a stabilization/solidification plan designed to ensure that all wastes disposed of in the landfill have been treated to the maximum extent practicable to minimize the potential for wastes migrating from the landfill site. At a minimum, the stabilization/solidification plan shall specify:

(a) The wastes which will be stabilized and/or solidified at the landfill site prior to disposal:

(b) The techniques which will be used to limit the solubility and potential for migration of the waste by:

1. The addition of materials that ensure that hazardous constituents are maintained in their least soluble form:

2. The production of monolithic blocks of treated waste with high structural integrity; and/or

3. The placing of a jacket or membrane of material of low permeability and low chemical reactivity between the waste and the landfill;

(c) The means that will be used to ensure that wastes which will not be stabilized or solidified at the landfill site will, to the maximum extent practicable, be stabilized or solidified at the site of generation of the waste, or at another facility where such stabilization or solidification can be lawfully done, if the landfill is not at the site of generation of the waste;

(d) A description of the physical and chemical properties of the stabilized/solidified waste (e.g., compressive strength, leachability); and

(e) A quality assurance program designed to ensure that the stabilized/solidified waste meets the specifications which are specified in the stabilization/solidification plan.

(2) The stabilization/solidification plan shall be submitted to the Department with the license application and upon approval by the Department shall become a condition of the license.

 

**30.633: Closure And Post-Closure Care**

(1) At final closure of the landfill or upon closure of any cell, the owner or operator shall cover the landfill or cell with a final cover designed and constructed to:

(a) Provide long-term minimization of migration of liquids through the closed landfill;

(b) Function with minimum maintenance;

(c) Promote drainage and minimize erosion or abrasion of the cover;

(d) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(e) Have a permeability less than or equal to the permeability of the bottom liner system.

(2) (Effective on and after July 1, 1988) After final closure of the landfill or upon closure of any cell, the owner or operator shall comply with all post-closure requirements set forth in 310 CMR 30.590, including, without limitation, maintenance and monitoring throughout the post-closure care period as specified pursuant to 310 CMR 30.592. The owner or operator shall:

(a) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap to correct the effects of settling, subsidence, erosion or other events;

(b) Maintain and monitor the leak detection, collection and removal system in compliance with 310 CMR 30.622(3);

(c) Continue to operate the leachate collection and removal system;

(d) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of 310 CMR 30.660;

(e) Prevent run-off and run-on from eroding or otherwise damaging the final cover;

(f) Maintain access roads in compliance with 310 CMR 30.622(10);

(g) Maintain gas collection and control systems, where present; and

(h) Protect and maintain surveyed benchmarks used in complying with 310 CMR 30.626.

(3) During the post-closure period, if liquid leaks into the leak detection, collection and removal system, the owner or operator shall comply with the provisions of 310 CMR 30.622(3).

**30.634 - 30.639: [Reserved]**

**30.640: Waste Piles**

(1) 310 CMR 30.640 through 30.649 prescribe requirements which apply to owners and

 